thereof. For example, the switches may be closed in some other sequence as may be appropriate for a given application without departing from the scope of the present invention. In addition, alternative circuit topologies for the network of tank capacitors and switches may be appropriate. The second terminal of the load may be connected to a potentially variable) voltage other than ground.

It is therefore intended by the appended claims to cover any and all such applications, modifications and embodiments within the scope of the present invention.

Accordingly,

What is claimed is:

[1. A system for efficiently charging and discharging a capacitive load from a single voltage source of a first potential consisting of:

a first switch for selectively charging the load;

a second switch for selectively discharging the load;

plural capacitive elements; and

switch means for selectively connecting each of the capacitive elements to the capacitive load to gradually charge or discharge the capacitive load.]

[2. The invention of claim 1 wherein said switch means includes plural third switches connected between said capacitive elements and said load.]

[3. The invention of claim 2 wherein said switch means includes means for selectively activating the first, second and third switches.]

[4. The invention of claim 3 wherein the capacitive load has a first terminal connected to the first switch and a second terminal connected to a source of a second potential.]

[5. The invention of claim 4 wherein the second switch has a first terminal connected to the first terminal of the load and a second terminal connected to said source of a second potential.]

[6. The invention of claim 5 wherein each of the third switches has a first terminal connected to the first terminal of the load and a second terminal connected to a first terminal of an associated one of the plural capacitive elements.]

[7. The invention of claim 6 wherein the means for selectively activating the first, second and third switches includes a finite state machine.]

[8. The invention of claim 7 wherein the finite state machine is designed to receive a clock signal and an input signal and provide selective activation signals for the first, second and third switches in response thereto.]

[9. The invention of claim 8 wherein a second terminal of each of the plural capacitive elements is connected to said source of a second potential.]

[10. The invention of claim 9 wherein each of the capacitive elements has a capacitance which is at least an order of magnitude greater than the capacitance of the load.]

[11. A method for efficiently charging and discharging a capacitive load from a single voltage source including the steps of:

providing a first switch for selectively connecting the voltage source to the load;

providing a second switch for selectively providing a short across the load;

providing plural capacitive elements;

providing plural third switches for selectively connecting each of the capacitive elements to the capacitive load; and

selectively activating the first, second and third switches to gradually charge or discharge the capacitive load.]